

TO: Board of Trustees Salmon Working Group
FROM: Randy Hagenstein and Dave Albert
SUBJECT: Critique of TNC Risk Assessment
DATE: Jan 16, 2012

Loeffler (2012) recently published a critique of efforts to assess potential risks to salmon associated with large-scale mining in Bristol Bay headwaters, with the general conclusion that such assessment is not valid in the absence of a specific mine plan that details strategies for risk prevention and mitigation. While we agree with many specific points related to the lack of data and applications of coarse assumptions, the broader conclusion of this critique is not substantiated, and appears to be designed to advocate a specific opinion rather than advance scholarship in applied risk assessment and management.

- 1) This critique is based on a mischaracterization of purpose and intent of the TNC's assessment of ecological risk to salmon associated with potential large-scale mining in Bristol Bay headwaters (E&E 2010):**
 - a. The TNC assessment was developed to provide a heuristic tool that informs and evaluates the range of possible outcomes, not predict specific events.
 - b. This necessarily required reliance on the scientific literature and historical record, along with coarse-scale assumptions and generalized models.
 - c. Uncertainty in actual expression of potential risk was discussed detail, as well as uncertainty associated with the lack of a specific mine management plan (MMP).
 - d. While an MMP may change the estimation of risk, the historical record suggests that an MMP is unlikely to eliminate potential for adverse outcomes (i.e., risk).
 - e. The role of this type of assessment in the scoping phases of development planning is to better inform decision-making, within TNC and with partners.
- 2) Recent application of Ecological Risk Assessment is much broader than this critique suggests:**
 - a. There is growing literature on risk assessment applied as relative planning tools applied at watershed (Bruins and Heberling 2005) and regional scales (Landis 2004) designed to inform broad-scale planning and management.
 - b. It is appropriate practice for early "screening" assessments to rely on coarse assumptions and conservative estimates, and does not eliminate the need for refinement by more comprehensive assessments using location-specific data as they become available (Hope 2006).
- 3) The critique presents an unsubstantiated reliance on the effectiveness of permitting and mitigation to avoid contamination:**
 - a. The Red Dog Risk Assessment was conducted because of a failure of the 1984 NEPA process to adequately address potential for contamination by fugitive dust, and thus is not analogous to the pre-development context of Bristol Bay.
 - b. At Kensington, unanticipated acid drainage and metal contamination has been documented despite successful completion of NEPA permitting and post-design risk assessment (Fairbanks News Miner, 17 Dec. 2010).
 - c. A systematic review of the effectiveness of mitigation measures required during NEPA permitting of hard rock mines concluded that strategies for mitigation were

frequently not effective in achieving desired outcomes for water quality, particularly for mines with close proximity or discharge into streams or wetlands (Kuipers et al. 2006).

4) The scope and framing of discussion suggests that the critique represents an opinion for a specific position rather than well-supported scholarship:

- a. While the critique purports to negate the validity of an entire category of risk assessment, it's conclusions are based on critique of a single example (E&E 2010) without any substantive review of the relevant literature, or useful contribution to improve methodology for similarly complex aspects of resource decision-making (e.g., Kampf and Haley 2011).
- b. Loeffler did not correspond with TNC staff in development of this critique, his claim that The Nature Conservancy has adopted an official position specifically with regard to the proposed Pebble Mine is not correct, and further his contention that TNC's position provides evidence that the ERA was intended to convey the inevitability of negative outcomes is also not correct.

5) Conclusion: While this paper recognizes many difficulties inherent in application of risk assessment, its conclusion is overly-generalized, not well supported, and appears to reflect the author's opinion for a specific position.

- a. It mischaracterizes the purpose and need that led to TNC's work,
- b. Describes a narrow set of ERA applications, ignores more recent literature on watershed and region-scale applications of risk assessment.
- c. It presents an overoptimistic assessment of effectiveness for mitigation measures to eliminate potential for negative outcomes (i.e., risk)
- d. Draws general conclusions about the validity of a method based on evaluation of a single example, without any generalizable criteria.

Literature Cited:

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- Kampf, M., and S. Haley. 2011. Risk management in the arctic offshore: wicked problems require new paradigms. Institute of Social and Economic Research. Working Paper 2011.3 Available online at: http://www.iser.uaa.alaska.edu/Publications/2011_10-riskmanagement.pdf
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